

CLAIMS:

1. A method of monitoring microseismic events in a hydrocarbon production reservoir provided with a well comprising inner production tubing and an outer casing, said method comprising the steps of:
 - a) providing two or more microseismic sensors adjacent the outer casing; and
 - b) processing an output of the microseismic sensors in order to provide the microseismic sensors with a directional response comprising a reduced sensitivity to noise coming from a direction of the inner production tubing, such that an ability of the microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced.
2. A method according to claim 1, wherein step (b) comprises providing the microseismic sensors with a cardioid response.
3. A method according to claim 1, wherein two or more second microseismic sensors are also provided between the inner production tubing and microseismic sensors located adjacent the outer casing, output of the second microseismic sensors nearer the inner production tubing being processed in conjunction with output of the microseismic sensors adjacent the outer casing in order to further enhance an ability of the sensors adjacent the outer casing to detect microseismic signals over a fluid flow noise.
4. A method according to claim 1, wherein increased sound insulation is provided between the microseismic sensors located adjacent the outer casing and the inner production tubing in order to further enhance an ability of the microseismic sensors adjacent the outer casing to detect microseismic signals over a fluid flow noise.
5. A method of monitoring microseismic events in a hydrocarbon production reservoir

provided with a well comprising an inner production tubing and an outer casing, the method comprising the steps of:

- a) providing one or more first microseismic sensors adjacent the outer casing of the well;
- b) providing one or more second microseismic sensors between the inner production tubing and the first microseismic sensors located adjacent the outer casing; and
- c) processing output of the second microseismic sensors nearer the inner production tubing in conjunction with output of the first microseismic sensors adjacent the outer casing such that the ability of the first microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced.

6. A method according to claim 5, wherein increased sound insulation is provided between the casing sensors and the production tubing in order to further enhance the ability of the sensors adjacent the casing to detect microseismic signals over the fluid flow noise.

7. A method of monitoring microseismic events in a hydrocarbon production reservoir provided with a well comprising an inner production tubing and an outer casing, said method comprising:

- a) providing one or more microseismic sensors adjacent the outer casing; and
- b) providing increased sound insulation between the microseismic sensors and the inner production tubing such that an ability of the microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced.

8. An installation for monitoring microseismic events in a hydrocarbon production reservoir provided with a well comprising an inner production tubing and an outer casing, the installation comprising one or more first microseismic sensors adjacent the outer casing and means for processing an output of the first microseismic sensors in order to provide the first microseismic sensors with a directional response comprising a reduced sensitivity to noise coming from a direction of the inner production tubing, such that an ability of the first microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced.

9. An installation according to claim 8, further including one or more second microseismic sensors positioned between the inner production tubing and the first microseismic sensors located adjacent the outer casing of the well, and means for processing an output of the second microseismic sensors in conjunction with an output of the first microseismic sensors such that an ability of the first microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced.

10. An installation according to claim 8, further including increased sound insulation between the microseismic sensors and the inner production tubing such that an ability of the microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced.